DESCRIPTIONS OF THREE NEW SPECIES OF MYXOMYCETES, WITH NOTES ON OTHER FORMS IN CENTURY XXV, OF ELLIS AND EVERHART'S NORTH AMERICAN FUNGI.

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The Myxomycetes recently issued in Century XXV of N. A. Fungi, E. and E., include an unusual number of representative American species. The following specific diagnoses and descriptions apply to three of these, which have hitherto been undescribed.

Physarum tenerum n. sp., No. 2489.

Sporangia stipitate, erect or nodding, exactly spherical in shape, about $\frac{1}{3}$ mm. in diameter; wall of sporangium single, membranaceous, but thickly studded with circular, flattened, yellow granules of lime, rupturing when mature in a more or less regularly laciniate manner. Stipes from 1 to $1\frac{1}{2}$ mm. in height, subulate, opaque, slender, of a light yellow color above, shading into a light brown below, longitudinally striate at the base or sometimes the entire length; columella wanting. Capillitium white, delicate, forming a loosely but regularly meshed network, with numerous small round or rounded yellow lime granules at the intersections. Spores dark brown, 7.5 to 8 μ. in diameter, with a delicately warted epispore which, however, is apparently smooth under a less amplification than about 700 diameters.

Fairmount Park, Philadelphia; Ohio, (Morgan.)

This is a delicate graceful Physarum, very fragile and evanescent, and seems to be distinct, by reason of its characteristic rounded lime granules, from any similar stipitate species. It might be mistaken for a globose form of *Tilmadoche mutabilis* but the capillitium is sufficiently distinctive.

The species varies somewhat according to locality, the Ohio specimens being a little larger, and having thicker and more calcareous stipes than is usual in the specimens found in the vicinity of Philadelphia. The walls of the sporangia when fully matured, generally rupture into several petal-like segments which finally become reflexed.

Trichia subfusca n. sp., No. 2495.

Sporangia stipitate, simple, very rarely double or triple, generally exactly spherical, exceptionally globose-turbinate, about $\frac{1}{2}$ to $\frac{2}{3}$ of a

mm. in diameter. Color of sporangia, a dull tawny brown above, shading to a dark brown at the base. Stipes uniform in diameter, and equal in height to the diameter of the sporangium, brown or brownish-black in color, longitudinally rugose and separated from the cavity of the sporangia by the internal layer of the sporangium wall. Spores and capillitium concolorous, of a bright yellow color in mass.

Elaters cylindrical 3.5 to 4 μ. in diameter, terminating generally in a smooth elongated end 10–12 μ. long, which is either sharp or blunt, straight or curved to one side. Spirals four in number, non-spinulose, winding more or less unevenly, with interspaces as wide or wider than the thickness of the spirals. Spores 11.5 to 12.5 μ. in diameter delicately but distinctly warted.

Adirondack Mts., New York.

This Trichia is more nearly allied to some of the forms of *Tr. fragilis* than to any other species. There seem, however, to be sufficiently well-marked specific differences. In addition to the different external characters, the elaters are undoubtedly cylindrical in a majority of the specimens. Occasionally individual sporangia are found in which the elaters are a little thicker in the center, narrowing slightly toward the ends, but even these exceptions terminate abruptly in the same form of ends as the true cylindrical elaters. Occasionally also, as with all Trichias, sporangia will be found in which the elaters are branched or distorted, or have a tendency to bulbous expansions near the ends or in their course, but these are abnormal and exceptional. The specimens distributed under this number (2495) were collected in August, 1889, with a few exceptions. The unusually wet season had the effect of rendering many of them much darker in color than is indicated in the foregoing specific diagnosis, which was drawn from types developed and collected under the most favorable conditions.

Trichia erecta n. sp., No. 2496.

Sporangia stipitate, usually simple, occasionally double or triple and very rarely fasciculate, with a cluster of 6 to 8 on a single stipe. Single sporangia globose or globose-turbinate $\frac{1}{2}$ to $\frac{2}{3}$ of a mm. in the transverse diameter.

Color of sporangia a dark nut brown, which is uniform below, but checkered or broken above into irregular patches with broad septa of a bright yellow color.

Stipes about 1 mm. in height, rough or granular on the surface, quite thick and equal throughout their length, and dark brown in

color. Spores and capillitium concolorous, being a bright yellow color in mass.

Elaters cylindrical, 3.75 to 4 μ. in diameter terminating in short, sharp, smooth ends 4 to 6 μ. long. Elater spirals 4 in number, spinulose with numerous irregular spines, coarse, winding irregularly. Adjoining spirals often united with each other by interspiral branches which run either longitudinally or obliquely in the direction of the spirals.

Spores 12–13 μ in diameter, delicately warted when examined under a high power lens.

Shawangunk and Adirondack Mts., N. Y.

This Trichia is conspicuous for the checkering or areolation of the upper surface in the perfectly mature sporangia, showing a sharp contrast between the adjoining nut brown and bright yellow colors. In this respect it resembles *Tr. fragilis* which sometimes exhibits in its var. *lateritia* and also in one of its simple forms, a dull mottling of the color of the upper surface of the sporangia.

The following species of Myxomycetes, also among those issued in the same Century, present special points worthy of record :—

Didymium eximium Pk., No. 2493.

The specimens distributed under this number correspond with the type of the species in the Herbarium of the N. Y. State Museum of Nat. History in Albany.

The thick yellow papyraceous or crustaceous walls of this interesting Didymium are generally permanent at the base, forming a sort of receptacle or cup. The white surface crystals of lime characteristic of the genus are scanty and occasionally wanting. The columellas are yellow in color, discoid, exceedingly rough on the upper surface and sometimes spinulose even to the extent of long spicules (in exceptional cases), penetrating to one-third the height of the sporangia.

The specimens under No. 2089, N. A. Fungi E. and E., which were also distributed as *D. eximium* Pk. differ in many respects from those just described, the sporangium walls being thin, membranaceous and translucent, when divested of the abundant, snow-white crystals of lime by which they are covered. The stipes are longer, darker and more slender, and the columellas, also discoid, are less roughened above and either pure white or yellowish-white in color. The spores in both forms are delicately warted when seen under a high power lens.

Having collected and examined the specimens issued under both of these numbers, I believe them to be referable legitimately to the same species.

They apparently form the extreme limits of what must be considered an extremely variable species, the intermediate and connecting links of which exist, and can be demonstrated by the examination of a sufficient number of specimens developed in different localities under varying conditions of growth.

Badhamia lilacina Fr., No. 2494.

It is difficult for a student of the American Myxomycetes to determine with certainty the species distributed under this number, from the published descriptions. The proverbial inadequacy of descriptions alone, in many cases, to create an intelligent conception of the objects described, is in this instance abundantly illustrated. The specimens distributed were all collected in the mountain districts of New York, and may be considered as representing the American form of this species. In some of its characters, this form differs so much from the original description of Fries and the later one of Rostafinski (as given in the Myxomycetes of Great Britain—Cooke), that an enlarged description is necessary to cover the points of difference. The most notable of these are the occasional development of stipes, and the existence of a crustaceous layer of lime on the outside walls of the sporangia, which crumbles and falls away in flakes at maturity, as in some of the double-walled Chondriodermas.

In the form in which it is found in New York and Pennsylvania the species may therefore be described as follows:

Sporangia closely aggregated, globose or obovate, usually sessile or substipitate, and occasionally stipitate. If stipitate, the stipe is short, varying in size from a mere point to $\frac{1}{8}$ of a mm. in height, light chestnut-brown in color and longitudinally striate.

Color of sporangia generally dull white above, becoming dusky about the middle of the sporangia and shading into a bright brown at the base. Capillitium white, composed of coarse irregular tubes filled with snow-white granules of lime, radiating from the center, which in most sporangia is occupied by a columella-like mass of lime to the wall of the sporangia, and communicating with each other by lateral branches.

Walls of sporangia thick, composed of a membranaceous internal layer, coated externally with a thick, easily separable layer of lime, which ultimately breaks and falls away. Spores dark violet 11.5 to

12.5 μ. in diameter, with thick epispores studded irregularly with peculiar, blunt, elongated projections, each of which by the use of a high power lens can be resolved into from 2 to 8 or more minute, irregularly cylindrical processes standing side by side, apparently joined by their bases, in rank or in irregular angular clusters.

The spore sculpturing is absolutely characteristic, and is the same in both European and American specimens. It does not resemble that of any known spore of the Myxomycetes and is well shown by the illustration in Rostafinski's Monografia Sluzowce.

The color of the sporangia is often modified, as is the case with some of the specimens distributed under No. 2494, by the readiness with which the external limy layer is stained by rain water, tinged with coloring matter from the decaying leaves on which the sporangia may be developed.

As the result of immaturity or imperfect development, a few individuals of a cluster of sporangia, may occasionally be found lacking the external layer of lime, either wholly or in part, in which case the membranaceous wall is beautifully iridescent.

The stipitate sporangia are solitary, not gregarious in habit of growth. They are ellipsoidal or obovate in shape and probably represent the highest stage of development of the species.